

RESPONSE AND REQUEST FOR RECONSIDERATION

Support.

The claims are amended to insert the word "about" to modify the lower limit of 10 percent. Support is found in the statement on page 25 line 25.

Response.

The Examiner has objected to the naming of the ranges of greater than 10 to about 20 percent (now amended to "greater than about 10") and 15 to about 25 percent as an improper introduction of new matter into the specification on page 6. Similarly, an objection is raised as to the use of these limits in the claims.

A standard for assessing added language regarding range limitations is whether one skilled in the art would consider it inherently supported by the discussion in the original disclosure. (MPEP 2163.05 III, citing *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).) If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. (MPEP2173.05(i), citing *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ187, 196 (CCPA 1997).)

Examining the new language and comparing it with the original disclosure, it is apparent that the presently claimed range limitations are proper. The originally filed specification, on page 6, explicitly discloses three ranges of the molar amounts of substituents having \overline{M}_n below 500, namely: "not more than 20 mole percent," that is,

0-20% and

0-15% and

0-10% (each range being modified by "about").

Thus, from the initial range of 0-20%, an explicit range of 0-15% was named, leaving, by permissible exclusion, a remaining range of 15-20%. Likewise 0-10% has been named, leaving, again by permissible exclusion, two remaining ranges of 10-20% and 10-15%. It is now two of these implicit ranges that are being claimed.

Accordingly, the ranges in question are fully supported by the specification as filed, they do not represent new matter, and their deletion is not required. If the examiner has a merely formal objection to the specific language inserted by the previous amendment to page 6, a phone call to the Undersigned may be appropriate to resolve the difference.

Moreover, if there is any further need for support for the numerical limit of 15 mole percent, this value, in particular, is reported in Table I on page 11.

The Examiner has rejected claims 1-16, 25, 27, and 28 as anticipated by or made obvious by Diana, US 5,936,041. The Examiner's objection, with regard to anticipation, was that Diana's upper limit, "less than about 10%" overlapped with the previously claimed lower limit of the present invention, that is, "more than 10 mole percent"

because of the added breadth supplied by the term "about." It is submitted that the present amendment avoids this problem. The present claims are now limited to those formulations in which the amount of hydrocarbyl substituent having a molecular weight of less than 500 is "more than about 10 to about 20 mole percent." Whatever limits were encompassed by the "about 10 percent" in Diana, the present claims are now limited to amounts greater than that. Accordingly, any anticipation by Diana is overcome.

It is noted that the anticipation rejection was not applied to claim 29, which specifies the range of 15 to about 20 mole percent and which is plainly distinct from any teaching of Diana. Separate consideration of this claim is respectfully requested.

As to the question of obviousness, any prima facie case is overcome by the data presented in the Declaration which accompanies this response. In the Declaration, Dr. William Abraham examined four detergents, each prepared with a heavy amine as specified in the present claims. The polyisobutylene substituents contained varying amounts of low molecular weight (less than 500 m.w.) materials – amounts of 7.1% (outside the present claims, characteristic of Diana); 15.4 %, 18.6% (both within the scope of the present claims), and 24.1% (outside the scope of the present claims, in the opposite direction from that of Diana, included for completeness). The results as shown in the Table are reproduced below:

Example:	1 (comp.)	2	3	4 (comp.)
% low m.w. substituent →	7.1	15.4	18.6	24.1
Test:				
Soot, T-8, D-values				
0.5%	0.04	0.08	0.13	0.10
2.0%	0.36	0.38	0.40	0.35
Sludge test #1173E, hours	99	≥122	116	115
Viscosity				
100°C (cSt)	15.77	16.05	16.60	16.29
40°C (cSt)	114.91	118.62	122.69	120.36
-15°C (cP)	2874	2787	2802	2822
HTCBT Corrosion (2 runs)				
Cu	27, 90	102, 127	136, 142	123, 120
Pb	87, 78	84, 49	64, 72	65, 63
Rating	4A, 4B	4C, 4C	4C, 4C	4C, 4C

The results show that the dispersants within the scope of the present claims exhibit significantly improved performance in soot handling, particularly at the lower (more rigorous) concentrations of dispersant. They also exhibit significantly improved performance in the Sludge test. Finally, they exhibit higher (better) viscosity at high temperatures, and lower (better) viscosity at low temperatures, all compared with the 7.1 % reference material.

These improvements are not expected based on any of the teachings of Diana. Hence, it is submitted that the claims are unobvious and allowable over this reference.

Claims 17-24 and 26 were rejected as made obvious by Diana further in view of Steckel, US 5,053,152. Steckel does not add anything to the teachings of Diana that would counter the unexpected advantages shown above. Steckel does disclose condensed amines, which are included in the subject matter of the noted claims. However, there is nothing in Steckel that would make it obvious to prepare a dispersant having the claimed limitations on the hydrocarbyl substituent, as has already been discussed.

Conclusion.

For the foregoing reasons it is submitted that the present claims are clear, novel, unobvious, and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (three times amended) A composition suitable for reducing engine sludge and degradation of elastomer seals comprising

a major amount of an oil of lubricating viscosity and

a minor amount of a nitrogen-containing dispersant wherein the nitrogen containing dispersant is a reaction product of

(I) a hydrocarbyl-substituted succinic acylating agent, wherein more than about 10 to about 20 mole percent of the individual molecules thereof have a hydrocarbyl substituent with a molecular weight of less than 500; wherein the hydrocarbyl substituent is a polymeric species consisting essentially of olefin monomer units of at least 3 carbon atoms; and

(II) at least one polyamine, wherein the polyamine is

(a) a polyalkylene amine containing at least one H-N< group; or

(b) a condensate of (i) a polyalkylene amine containing at least one H-N< group with (ii) at least one alcohol containing at least one ether group, amine group, nitro group, or additional alcohol group;

wherein in said polyamine (a) or condensed polyamine (b) no more than about 20 mole percent of the molecules contain 6 or fewer nitrogen atoms.

28. (three times amended) A composition suitable for reducing engine sludge and degradation of elastomer seals comprising

a major amount of an oil of lubricating viscosity and

a minor amount of a nitrogen-containing dispersant wherein the nitrogen containing dispersant is a reaction product of

(I) a hydrocarbyl-substituted succinic acylating agent wherein the hydrocarbyl substituent is prepared from a polymeric species consisting essentially of olefin monomer units of at least 3 carbon atoms and wherein more than about 10 to about 20 mole percent of the individual molecules of said polymeric species have a molecular weight of less than 500; and

(II) at least one polyamine, wherein the polyamine is

(a) a polyalkylene amine containing at least one H-N< group; or

(b) a condensate of (i) a polyalkylene amine containing at least one H-N< group with (ii) at least one alcohol containing at least one ether group, amine group, nitro group, or additional alcohol group;

wherein in said polyamine (a) or condensed polyamine (b) no more than about 20 mole percent of the molecules contain 6 or fewer nitrogen atoms.